2001 COLONIAL WATERBIRD BREEDING SUMMARY
CAPE HATTERAS NATIONAL SEASHORE

Colonial waterbirds established nine active colonies along Cape Hatteras National Seashore (CAHA) in 2001. Birds began establishing and defending territories at four additional sites but were abandoned before nesting and declared inactive. Species breeding on Seashore beaches this year include; Least Tern (*Sterna albifrons*), Common Tern (*Sterna hirundo*) and Gull-billed Tern (*Gelochelidon nilotica*), as well as Black Skimmers (*Rinchops niger*). Nest surveys were conducted between June 8 and July 15, 2001. Breeding activity occurred between May and August. In many cases, birds utilized areas already closed to the public for breeding American Oystercatchers (*Haematapus palliatus*) and Piping Plover (*Charadrius melodus*). In other areas, symbolic fencing was erected once birds were observed exhibiting courtship behavior or nests were found. As in recent years, most of the colonies were comprised of small groups of Least Terns with the exception of a large mixed-species colony located at Ocracoke Inlet flats. A total of 890 nests were located in the Seashore this season (Table 1). This is an increase over last year's record low of 465. It is however, a 45% decline since monitoring began in 1977 (Table 1). The number of established colonies decreased from 18 in 2000 to nine this season. North Carolina Wildlife Resource Commission (NCWRC) surveyed a recently formed shoal located on the southwest side of the Bonner Bridge at Oregon Inlet. A total of 189 nests were recorded here, with 186 being Common Tern nests. There is presently discussion of the shoals ownership, part of which may belong to CAHA and Pea Island Wildlife Refuge (PIWR). This season neighboring PIWR had a mixed species colony comprised of 266 nests located at its northern end near the terminal groin. Ten peak season surveys were conducted at CAHA between 1977 and 2000. During this period, annual nest numbers have ranged from 465 to 1637 (Chart 1). Of the 890 nests found this year, 834 were found at Ocracoke Inlet flats. All sites had high incidents of breeding failure, with the exception of the Ocracoke Inlet site.

Weather was not a major factor contributing to nest failures this year. Two overwash incidents occurring in mid-May and late-July did not significantly impact nesting activities. Predation and human related disturbances contributed to some known nest and chick loss.

Breeding Sites

Bodie Island

For the third consecutive year Least Tern activity was reported at the Oregon Inlet flats on Bodie Island. Over 20 pair congregated in a heavily used off-road vehicle (ORV) and day use area. Closure was immediately erected as birds were conducting courtship behavior. The site was abandoned after two days of rainy weather and fresh vehicle tracks through the bird closure. This is of interest since Bodie Island has not supported a successful colony in at least six years. In 1999, Least Tern courtship displays were observed early in the season but no nesting occurred. In 2000, Least Terns established a small colony at this same site but it was abandoned after nests were lost to overwash. Birds may have moved to the nearby colony on Oregon Inlet's south side at Pea Island National Wildlife Refuge.

Hatteras Island

On the island's east-facing beaches, five active Least Tern colonies were established compared to eleven colonies in 2000. Birds exhibited territorial behavior at two additional locations but most pairs abandoned the sites without nesting. Of the five active sites, two were found between ramps 23 and 27, one was established on the south side of Ramp 30 and one was situated on the beach across from the Haulover day use area. A new colony was located 0.5 miles south of the original Cape Hatteras

Lighthouse site. Two of the five colonies were in vehicle-free zones. All areas were posted when bird activity was found. Productivity success was low at all sites. As with past years there were fewer nests found than expected based on the adult activity observed. Fifty- three nests were documented. Except for the 28 nests found at the Haulover site, only small numbers of nests were found elsewhere. At least a few chicks were spotted at each site, excluding the colony located 2.2 miles north of Ramp 23. No fledglings could be verified. Incidents of ORVs breaking through closures as well as pedestrian traffic through colonies were documented. At some sites, nearby human activities were found to flush birds from their nests. Evidence of crow (*Corvus spp*.), feral cat (*Felis domesticus*), white tailed deer (*Odocoileus virginianus*) and red fox (*Vulpes vulpes*) frequently recorded in various closures. Red fox have only been reported on Hatteras Island this past year. Predation was verified in some closures. Reproductive success has been low along these beaches for several years. It should be noted that fewer sites were occupied this year between Ramps 23 and 27, north of Ramp 34 and the north side of Avon village.

Similarly, poor reproductive success was found on south facing beaches of lower Hatteras Island where two Least Tern colonies were established in ORV zones. Counts at Cape Point, once a very important breeding ground, have dwindled in recent years. In the 2001 season, no colonial waterbirds utilized the site. Of the two active sites, one was situated between the interdunal road of the large salt pond and Ramp 45. The second was the South Beach site between Ramps 45 and 49. These sites may have been previously combined under one South Beach colony but enough distance separates the two to warrant individual recognition this year. At Ramp 45 Least Terns were joined by a few Gull-billed Terns and Black Skimmers. All vacated the area except a few Least Terns. No nests were documented before heavy rains arrived with tropical depression Allison. After the rains few birds remained. No chicks were ever observed. Seven nests were found in the small Least Tern colony on the South Beach (Table 1). Avian and mammalian predation on eggs was documented. Both of the colonies were located in existing bird closures. Though some colonial waterbirds appeared to be establishing a colony at Hatteras Inlet spit, the birds vacated the site early in the season. Throughout the mid to late 1990's this inlet site supported high numbers of nesting birds. In 1997 over 1200 birds, representing several species, were recorded here. It is likely that many birds joined the colony on the Ocracoke flats. Factors known to have contributed to low productivity along the south facing beaches in 2001 include inclement weather, vehicle traffic, nearby human recreational activities, avian and mammalian predation. Rangers on night patrol along the South Beach and Cape Point areas often saw red fox. Their tracks were found throughout this area. It is interesting to note that few signs of feral cats were found along the south facing beaches this season. Possibly past trapping efforts were effective in reducing the feral cat population. It is possible that the red fox preyed on cats.

Ocracoke Island

Two colonies were established on Ocracoke Island. A small Least Tern colony was located on a narrow stretch of beach approximately 1 mile northeast of the lifeguard stand near Ramp 70. Four nests were found but no chicks were seen. Birds were observed being disturbed by the pedestrian traffic flowing between the lifeguard beach and the campground. This section of beach is closed to vehicles. The Ocracoke Inlet flats supported the largest and most productive colony in the Seashore this year with 834 nests (Table 1). This number is an increase in last year's record low of 406. However, it is low when compared to 1075 nests found at the same site in 1999. Least, Gull-billed and Common Terns as well as Black Skimmers nested here. Nest densities were greatest where elevation was highest. Hatching and fledgling rates appeared high. Only a small number of nests were lost to weather related tides on this low-lying beach and flats. These overwash tides occurred in early June and late July. Mink and cat tracks were not frequently observed this year. Predatory birds, such as crows and gulls (*Larus spp*.) did not congregate near the Ocracoke colony.

Species Evaluation

The total number of beach nesting colonial waterbirds has declined 45% since surveys began at CAHA in 1977. Furthermore, all individual species, excluding Gull-billed Terns have declined on CAHA beaches since surveys began. (Table 2). In 2001 Gull-billed Tern nest numbers were the highest ever recorded at 108 nests. This represents a 97% increase over last year's record low of three nests (Chart 2). Numbers have shown much variability over the years. However, the greatest increases were found in 1999 and 2001. This is noteworthy since the species is listed as threatened in North Carolina. Common Tern nests numbers peaked in 1977 at 802 (Chart 3). This year's count of 387 nests represents a 50% decline. Least Tern numbers at CAHA were greatest in 1993 with 716 nests recorded (Chart 4). The 210 nests found in 2001 represent a 72% decrease. For the past three years, the only area that has supported Gull-billed Tern, Common Tern and Black Skimmers has been Ocracoke Island spit. Least Terns remain difficult to census since the nesting population often abandon sites and later establish new colonies in other locations within CAHA. A high of 454 Black Skimmer nests was documented in 1977 (Chart 5). The 193 nests found this season represent a 57% decline in CAHA.

Shade Structures

It has been noted that young chicks are attracted to the closure posts to take advantage of shade. In ORV areas, vehicles drive along the immediate edge of the closure. This puts chicks in close proximity to life threatening situations. To address this problem we placed approximately one dozen shade structures within the Ocracoke flats colony. Each was an open wooden structures made with 10" x 6" tops supported at each end by 3" x 6" "legs". Chicks were observed utilizing the shade boxes. On one occasion, the chicks were seen on top of the structures escaping flood tides. However, chicks were still seen using the shade created by the closure posts. Six additional shade structures were placed at the Ramp 30 colony after eggs hatched. Only one chick was observed using a structure. No avian predators were observed homing in on the boxes at either location. There are plans to further test and better monitor their use next year.

NCWRC has documented a sharp decline in Gull-billed Terns, Common Terns and Black Skimmers throughout the state (Table 3). These declines reflect the diminished amount of suitable and undisturbed habitat available in the state. The Ocracoke Island spit has proven to be an important refuge for these species. The largest number of these species found in North Carolina was in this colony (Dave Allen, NCWRC, personal communication).

Human Disturbances

Nesting colonies along much of the east and south of Hatteras Island and Ocracoke Island were again located on narrow beaches and in areas of high visitor use. Colonies situated on narrow beach sections are more exposed to disturbances caused by human activity. At least three colonies did not have enough of a buffer between nests and human activities. If posted areas were enlarged to better reduce human disturbances, ORV passage and other recreational activities would be limited. The South Beach colony buffer was actually reduced to allow passage of ORV's after shoreline changes occurred. Exceptionally high tides at the end of July made ORV passage temporarily impossible in front of the colony located 1.3 miles north of Ramp 27. Some ORV"s turned around during these impassable periods. However, at least three sets of ORV tracks where found within the site. The two chicks in this colony were not seen after

this. Unrelated to tide, a set of ORV tracks was found throughout the same colony. Approximately nine bird pairs, who had previously been seen siting in scrapes, were not seen after the vehicle drove through the closure. At Ocracoke Inlet, several chicks were found crushed in ORV tracks.

Frequent human disturbance can cause the abandonment of nest sites as well as direct loss of eggs and chicks. Numerous incidents of park visitors entering posted bird closures were documented between May and September of 2001. These closures represented sites where colonial waterbirds and other species, such as American Oystercatchers and Piping Plover, nested. Most illegal entries were not witnessed. Documentation was based on vehicle or pedestrian tracks left behind. Numbers are conservative since some records involved more than one vehicle or pedestrian. A total of 63 were recorded of off-road vehicles entering posted bird closures. This number is similar to the 58 vehicle entries documented in 2000. Of the 63 incidents reported in 2001, 33 occurred on Bodie Island, 21 on Hatteras Island and nine on Ocracoke Island. These incidents required, at minimum, repairs to twine strung between posts but often involved the replacement of broken posts and signs. 247 incidents of pedestrians illegally entering bird closures were recorded in 2001 compared to 56 incidents recorded last year. In part, this increase reflects more thorough documentation. Of the 247 incidents reported, 148 occurred on Bodie Island, 95 on Hatteras Island and four on Ocracoke Island. Contacts were made with several people found defecating within the posted area. Judging by the amount of human feces and toilet paper left behind, this was one of the main reasons people entered the closures. Others contacted said they thought the closures were only for ORVs though the signs clearly state pedestrian entry is also prohibited. Each pedestrian entry required visitors to lift and bend to get under string that connects posted signs.

Predation

Feral cats have been identified as a serious predator. In March of 2001, grant money became available to study feral cat populations in CAHA and to trap live cats. Traps, donated by the American Bird Conservancy, were placed in areas where tracks were observed. Between March and September of 2001, cats were trapped as they moved back and forth between the beaches and interior vegetation. Trapped animals were transferred to Dare County Animal Shelter. The final report on this project will be submitted to CAHA in March 2002. Red fox populations have been expanding their range southward in CAHA. They were first reported on Bodie Island in 1996 and on Hatteras Island in 2000. Their presence has impacted all ground nesting birds at Oregon Inlet flats, Cape Hatteras Lighthouse beach, Cape Point, South beach and possibly Hatteras Inlet spit. The new Hatteras Island fox population likely used the Bonner Bridge as a corridor to the island last year. There are no historical records of red fox on the island. Control of individual foxes that habitually roam bird nesting areas should be considered to protect State listed colonial waterbirds and Federally listed Piping Plover. American Oystercatcher, having no State or Federal status as of yet, is also impacted by this predator while breeding in CAHA. Avian predators such as crows and sub-adults gulls are increasing in CAHA and tend to loaf in areas where people congregate in the summer months. These are often the same areas where colonial water birds nest. NCWRC is seeing an increase in nesting Laughing Gulls (*Larus atracilla*), Herring Gulls (*Larus argentaus*) and Black-back Gulls (*Larus marinus*) on dredge islands (Dave Allen, personal communication).

Conclusion and Recommendations

Productivity was low in the small colonies scattered throughout the Seashore this season. Breeding success was highest in the colony located at Ocracoke Inlet flats. The posted area was large, reducing potential human disturbance except near its periphery. Predation pressure was low. The absence of major

storm related overwash incidents was a key factor in its success. NCWRC has recommended that CAHA enhance this important site by creating additional "high ground". This could be done by placing driftwood in the area in hopes of catching sand and thus building more small dunes.

Ownership of the large shoal at the mouth of Oregon Inlet needs to be identified. It may be that State and Federal agencies cooperate in its protection should it continue supporting nesting birds.

CAHA staff needs to be more aggressive in protecting breeding habitat in the spring. Potential breeding grounds within CAHA must be promptly identified and protected, even before birds arrive when possible. Closing areas after birds appear is not the best management practice. They have most likely been disturbed by pedestrians and/or vehicles. Park staff definitely disturbs the congregation of birds in the process of posting closures. This could lead towards site abandonment. Many closures should be enlarged to decrease human disturbance. The draft North American Colonial Waterbird Conservation Management Plan recommends a minimum buffer of fifty yards to the nearest nest. Implementing this management recommendation would result in the seasonal closure of some areas to ORV's and other recreational activities. The impact from human disturbance needs to be better monitored.

Efforts to reduce feral cat populations need to continue. Control of native predators that target any State listed threatened or endangered species should be considered. CAHA's pet leash law needs consistent enforcement.

The reduced presence of law enforcement rangers has taken its toll. Many visitors ignore regulations. The majority of dogs are unleashed and run freely. Incidents of people entering posted bird areas have increased dramatically. These behaviors reflect the need to increase enforcement patrols.

Public education should be a priority. Visitors need to be aware of the birds' vulnerability and steps that can be taken to reduce human disturbances. This can be done through interpretive literature, programs, and roving contacts. For example, kite flying activities are increasing, especially the use of large kites. Visitors need to know they must stay far from colonies while involved in this activity.

Development along the North Carolina coast is increasing at a fast pace. Thus Federal lands such as Cape Hatteras National Seashore, Cape Lookout National Seashore and Pea Island National Wildlife Refuge become increasingly important for the future of colonial waterbird survival. Many species are showing serious declines in North Carolina. It is vital we manage our sites in such a way to provide suitable, undisturbed habitat for these nesting birds.

Submitted by Marcia Lyons
Natural Resource Management Specialist
January, 2002

2001 ACTIVE COLONIAL WATERBIRD LOCATIONS
CAPE HATTERAS NATIONAL SEASHORE

Hatteras Island

CWB Colony BH1
(2.9 – 1.3 miles north of Ramp 27)

35° 30.673	075° 28.374
35° 30.668	075° 28.402
35° 30.786	075° 28.355
35° 30.801	075° 28.367

CWB Colony BH3
(2.2 miles north of Ramp 27)

35° 30.133	075° 28.506
35° 30.131	075° 28.503
35° 30.064	075° 28.523
35° 30.062	075° 28.543

CWB Colony H1
(South Beach Bird Closure, Frisco)
R45 - Frisco (south beach)

35° 13.895	075° 32.738
35° 13.858	075° 32.768
35° 13.927	075° 33.407
35° 14.019	075° 33.407
35° 14.018	075° 33.432
35° 14.035	075° 33.530
35° 14.036	075° 33.533
35° 14.066	075° 33.721
35° 14.058	075° 33.763
35° 14.081	075° 33.963
35° 14.073	075° 34.006
35° 14.086	075° 34.138
35° 14.095	075° 34.342
35° 14.120	075° 34.342

CWB Colony H2
(Just S of Ramp 30)

35° 26.014	075° 29.074
35° 26.013	075° 29.058
35° 26.091	075° 29.049
35° 26.245	075° 29.040
35° 26.254	075° 29.052

CWB Colony H3
(Lighthouse Beach, ca. 1/2 mile S of life guard stand)

35° 14.798	075° 31.472
35° 14.802	075° 31.530
35° 14.924	075° 31.432
35° 14.941	075° 31.467
35° 14.566	075° 31.554
35° 14.590	075° 31.530
35° 14.686	075° 31.506
35° 14.698	075° 31.555

CWB Colony H4
(Ramp 45 bird closure)

35° 13.895	075° 32.738
35° 13.858	075° 32.768
35° 13.927	075° 33.407
35° 14.019	075° 33.407
35° 14.018	075° 33.432
35° 14.035	075° 33.530
35° 14.036	075° 33.533
35° 14.066	075° 33.721
35° 14.058	075° 33.763
35° 14.081	075° 33.963
35° 14.073	075° 34.006
35° 14.086	075° 34.138
35° 14.095	075° 34.342
35° 14.120	075° 34.342

CWB Colony H6
(1.2 miles S of R38; Haulover)

35° 17.936	075° 30.754
35° 17.930	075° 30.721
35° 18.071	075° 30.683
35° 18.260	075° 30.657
35° 18.260	075° 30.677

Ocracoke Island

CWB Colony

35° 15.481	75° 85.118
35° 16.346	75° 82.924
35° 16.569	75° 82.390
35° 16.984	75° 81.280
35° 17.007	75° 81.219
35° 17.137	75° 80.878
35° 17.167	75° 80.786
35° 17.165	75° 80.790

Table 1. 2001 Number of Colonial Waterbird Nests
Cape Hatteras National Seashore

Location	Common tern	Least tern	Gull-billed tern	Black skimmer	Total
Ramp 27A*		1			1
Ramp 27 B**		1			1
Haulover Day Use Area		8			8
CH Lighthouse Beach		7			7
South side of Ramp 30		28			28
Ramp 45		0			0
South beach		7			7
Ocracoke Life-guard beach		4			4
Ocracoke Inlet flats	387	146	108	193	834
Total	**387**	**202**	**108**	**193**	**890**

*1.3 to 1.9 mi. N of R27
**2.2 mi. N of R27

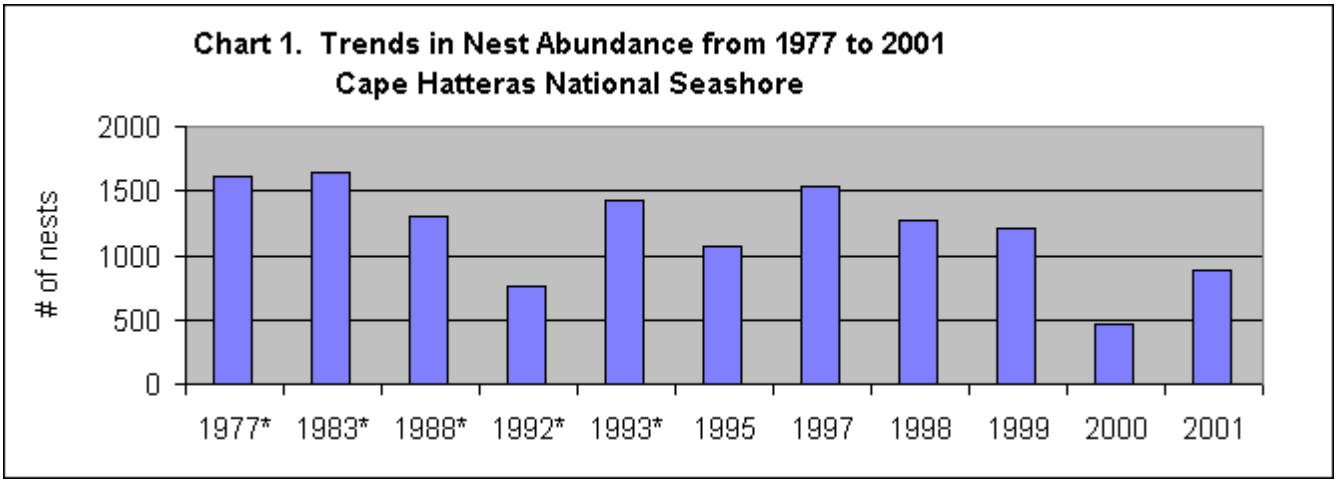
Table 2. 1977 - 2001 Trends in Number of Nests
Cape Hatteras National Seashore

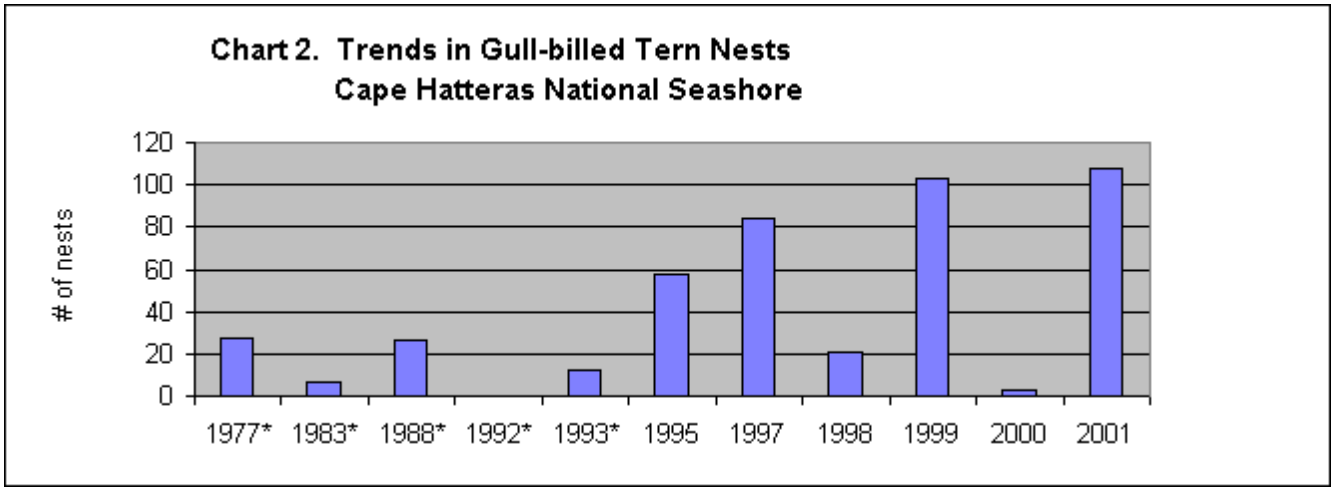
	1977 *	1983 *	1988 *	1992 *	1993 *	1995	1997	1998	1999	2000	2001
Species											
Gull-billed tern	27	7	26		12	58	84	21	103	3	108
Forster's tern	382	63				31					
Common tern	802	763	678	278	422	503	718	715	440	129	387
Least tern	121	508	450	454	761	342	278	173	355	184	202
Sooty tern					1						
Black Skimmer	286	296	144	30	226	139	454	366	306	149	193
Total	**1618**	**1637**	**1298**	**762**	**1422**	**1073**	**1534**	**1275**	**1204**	**465**	**890**

*Surveys conducted by J. Parnell, University of North Carolina, Wilmington

Table 3. Colonial Waterbird Nests in Coastal North Carolina									
	1977	**1983**	**1988**	**1990**	**1993**	**1995**	**1997**	**1999**	**2001**
Least tern	227	1653	1528	2276	2222	1992	882	1382	1742
Common tern	4885	2247	2610	1214	2122	1699	952	888	1131
Gull-billed tern	621	233	151	101	155	249	137	154	258
Forster's tern	1405	936	933	850	1593	1117	867	812	23
Black Skimmer	1925	797	643	278	1084	683	570	679	594
Total	**9063**	**5866**	**5865**	**4719**	**7176**	**5740**	**3408**	**3915**	**3748**

Compiled by North Carolina Wildlife Resources Commission





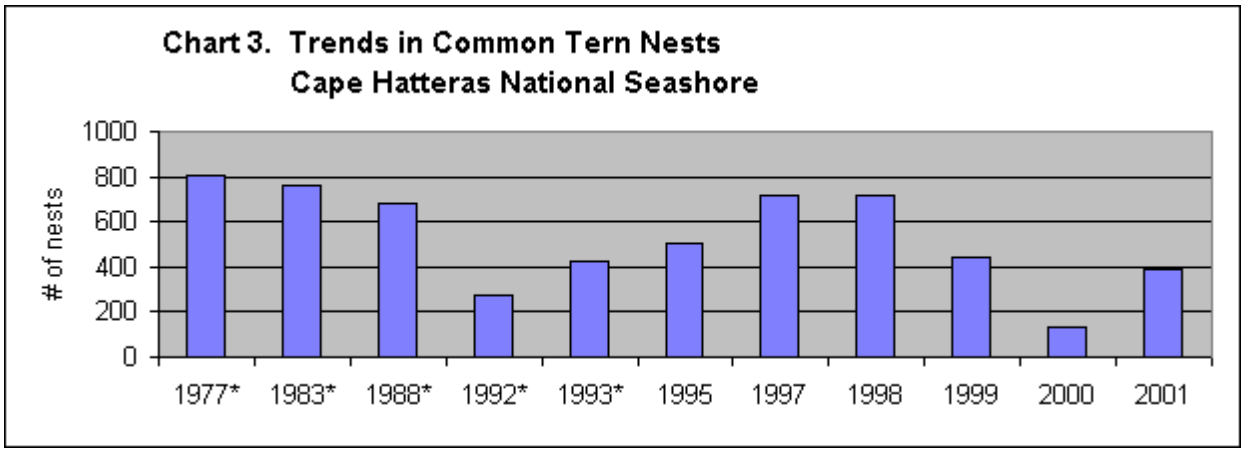


Chart 3. Trends in Common Tern Nests
Cape Hatteras National Seashore
# of nests
1000
800
600
400
200
0
1977*
1983*
1988*
1992*
1993*
1995
1997
1998
1999
2000
2001

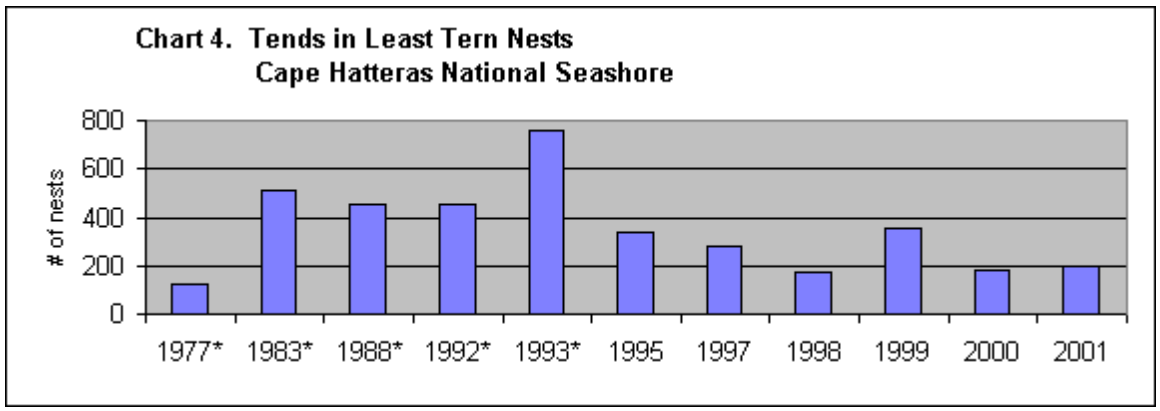


Chart 4. Tends in Least Tern Nests
Cape Hatteras National Seashore
# of nests
800
600
400
200
0
1977*
1983*
1988*
1992*
1993*
1995
1997
1998
1999
2000
2001

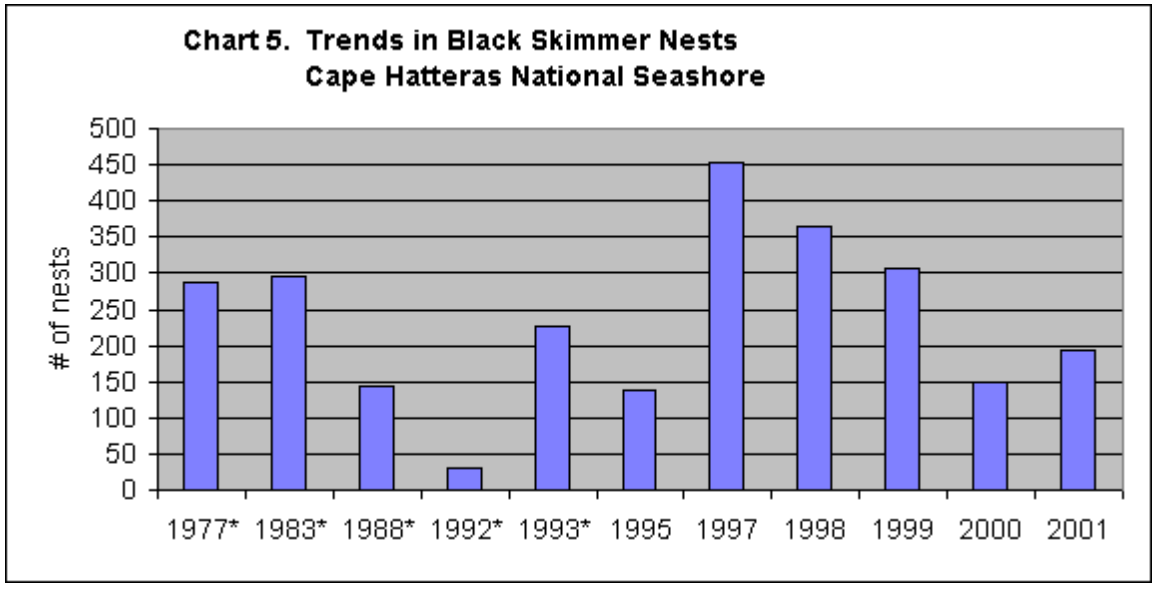


Chart 5. Trends in Black Skimmer Nests
Cape Hatteras National Seashore
# of nests
500
450
400
350
300
250
200
150
100
50
0
1977*
1983*
1988*
1992*
1993*
1995
1997
1998
1999
2000
2001